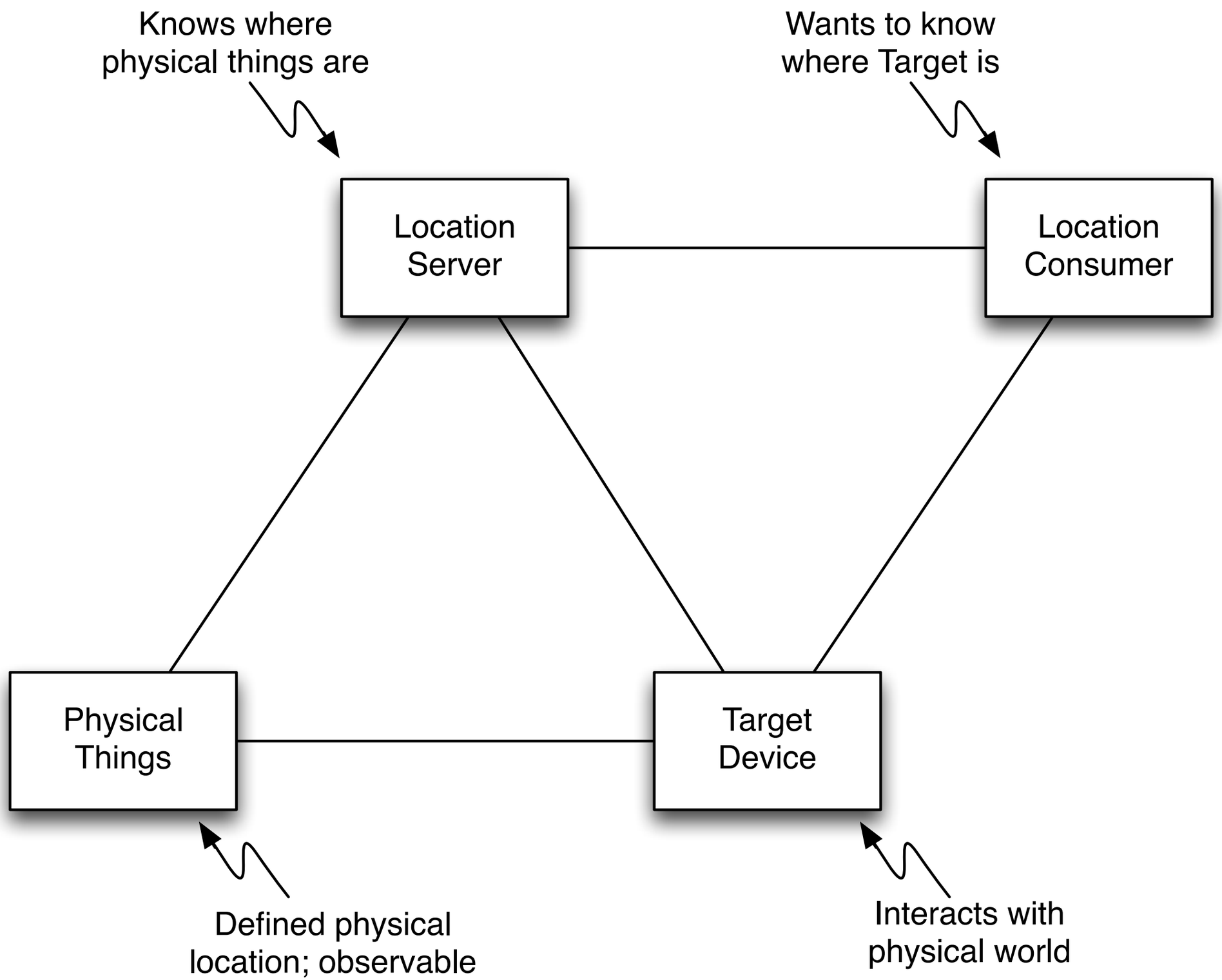
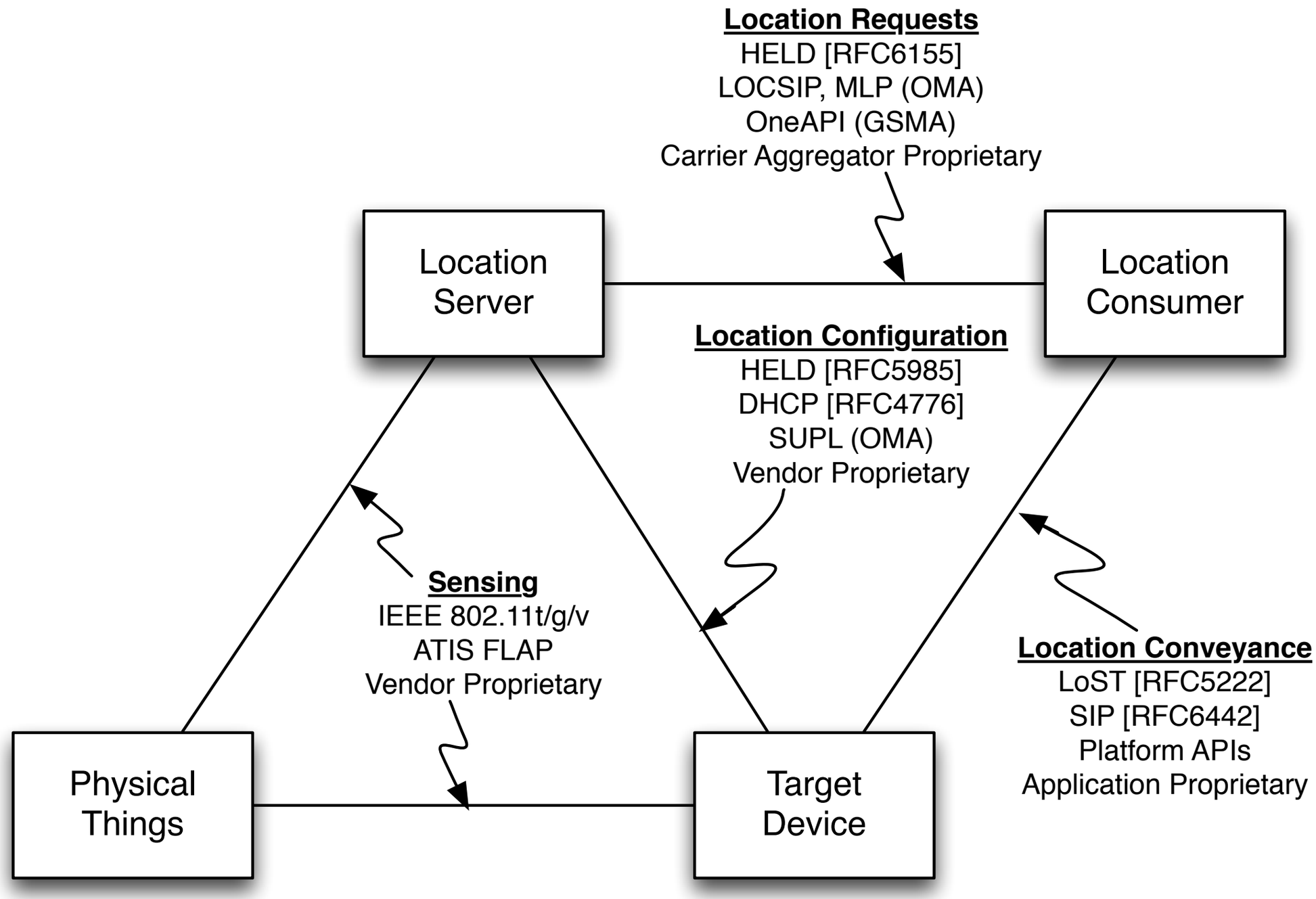
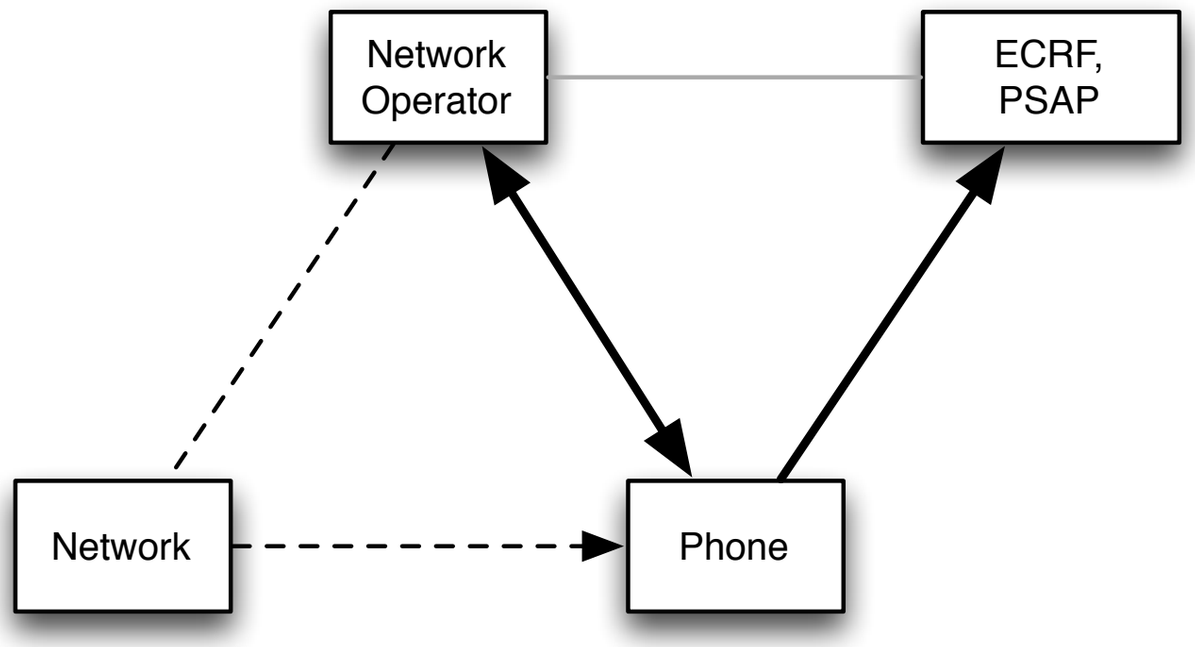
# Geolocation Standards

(And how they **can** help)


Knows where
physical things are
Wants to know
where Target is
Location
Server
Location
Consumer
Physical
Things
Target
Device
Defined physical
location; observable
Interacts with
physical world


Location Requests
HELD [RFC6155]
LOCSIP, MLP (OMA)
OneAPI (GSMA)
Carrier Aggregator Proprietary
Location Server
Location Consumer
Location Configuration
HELD [RFC5985]
DHCP [RFC4776]
SUPL (OMA)
Vendor Proprietary
Sensing
IEEE 802.11t/g/v
ATIS FLAP
Vendor Proprietary
Location Conveyance
LoST [RFC5222]
SIP [RFC6442]
Platform APIs
Application Proprietary
Physical Things
Target Device




## GEOPRIV

**DHCP:** Location server URI

**HELD (over HTTP):**

```
<locationRequest/>
<locationResponse>
  <!-- location -->
</locationResponse>
```

## ECRIT

**LoST (over HTTP):**

```
<findService>
  <!-- urn.service.sos -->
  <!-- location -->
</findService>
<findServiceResponse>
  <!-- PSAP URI -->
</findServiceResponse>
```

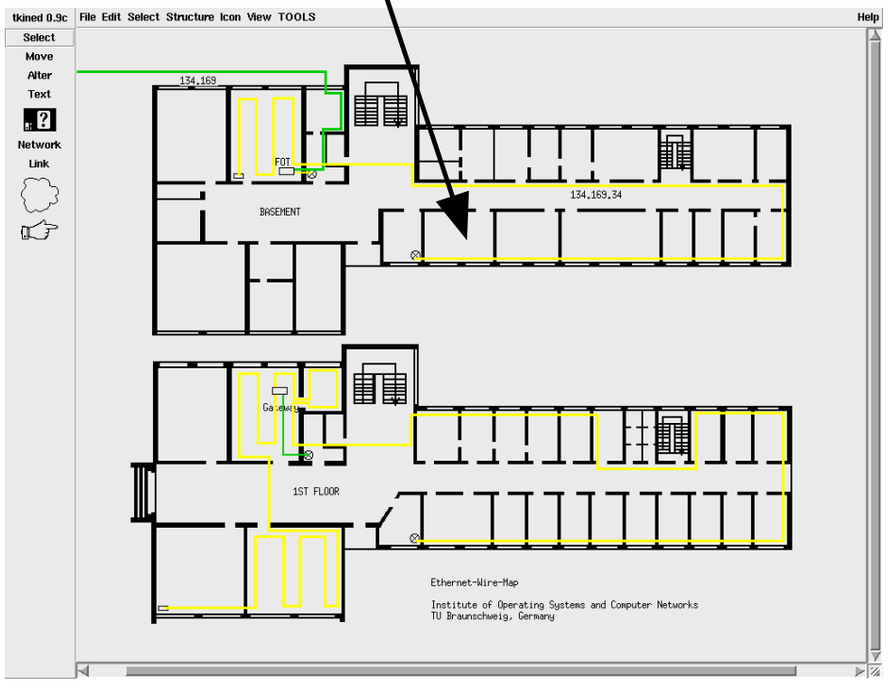
**SIP:**

```
INVITE <psap@example.com> SIP/2.0
Geolocation: <geo:37,-80;r=100>
```

- This is all actually really simple*
- Ubiquitous indoor positioning is not a technology problem
- It's a data problem

* Except for the physics





tkined 0.9c
File Edit Select Structure Icon View TOOLS
Help
Select
Move
Alter
Text
Network
Link
134.169
FDT
BASEMENT
134.169.34
Gateway
1ST FLOOR
Ethernet-Wire-Map
Institute of Operating Systems and Computer Networks
TU Braunschweig, Germany

# Who has the data?

- GPS: 1 source (USAF)
- Cellular: 4 sources (major carriers)
- Indoor: 10^n sources (n=4-5)
  - McDonalds, Starbucks, Tyson's Corner, ...
- How do all these entities talk to a PSAP?
  - Centralized / distributed databases
  - Directly / indirectly (via phones)

# Utility of Standards

- Indoor positioning is a data problem
- Standard protocols are good at pushing data between independent entities
- But the entities need to decide to share data in the first place